CLASSIFICATION SECRET

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

CD NO.

COUNTRY East Germany

DATE DISTR

SUBJECT Germanium Transistor Development at VEB Werk fuer Baulemente der Nachrichtentechnik, Teltow

NO. OF PAGES 2

25X1

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO.

SUPPLEMENT REPORT NO.

25X1

THIS IS UNEVALUATED INFORMATION

1. Through application of the Bridgeman method for the making of pure germanium monocrystals, VEB Werk fuer Baulemente der Nachrichtentechnik, Carl von Ossietzky (formerly Dralowid), in Teltow, has succeeded in producing crystals with a degree of purity of 40 ohm centimeters[1]. 25X1
Samples of point-contact transistors made from these crystals during the development process have an output amplification up to 1,000, with a voltage amplification amounting to several hundred. During October and November 1954, the Dralowid transistor development team under the supervision of Dr. Mathias Falter, assisted by mathematician G. Raabe and physicist Blankenburg (fnu), succeeded in further improving the purity of the germanium monocrystals obtained through the application of the Bridgeman method. The maximum degree of purity reached as 25X1
of mid-November 1954 was 55 ohm centimeters.

2. During the fall of 1954, the Dralowid plant started to build an installation for the application of the "zone melting procedure" (Zonenschmelzverfahren) for the purification of germanium. However, the Dralowid development team digressed in one important essential from this method. The essential feature of this procedure consists of melting germanium monocrystals gradually; the monocrystals are not contained in crucibles during the process, to avoid the diffusion of impurities from the walls of the crucible into the germanium. The Dralowid plant, however, used a quartz container called a Schiffchen, shaped like half of an oblong half tube (i.e. a tube halved along its longitudinal axis). The germanium was put into this half tube and the Schiffchen with its germanium contents was placed in a larger quartz tube. This quartz tube was surrounded by induction coils of two windings each; the coils were at intervals of 10 centimeters from each other. There were four or five coils. The coils were heated by a transmitter and the quartz tube with the Schiffchen inside it was moved horizontally at a slow speed within the coils. In this way, the germanium was melted and purified. It developed that the purified germanium still contained too many silicon impurities stemming from the quartz, because the silicon impurity ratio (the number of impurities in crystallized germanium in relation to their number in molten germanium), is greater than 1. As soon as this mistake was realized, the Dralowid team decided to apply the zone melting procedure in its original version. In this version,

CLASSIFICATION SECRET

STATE	#	x	NAVY	x	NSRB		DISTRIBUTION			OSI Ev	x
ARMY	#	x	AIR Ev#	x	FBI						

25X1

the germanium is moved through melting zones without being put into a container, and thus without being exposed to container impurities. This improved version of the zone melting procedure, however, had not been yet started, because the transmitter for the induction heating broke down in early November 1954 and was undergoing repairs.

3. The Dralowid team also completed an installation for the application of the Czrochalsky method for the purification of germanium. The first results obtained were germanium monocrystals of 10 centimeter length with a diameter of 5 millimeters. These crystals, however, did not have straight shapes but were rather uneven in thickness due to bad temperature control. The degree of purity did not exceed the degree of purity of the best samples obtained through the application of the Bridgeman method. The experiments with the Czrochalsky installation were to be continued as soon as the transmitter for induction heating (a 3.5 kw Lorenz Hochsender) was repaired. It is hoped that through improvement of the present Czrochalsky installation more homogenous crystals can be obtained than through application of the Bridgeman method. The highest purity obtained with the Bridgeman method is found well inside the germanium crystals its outer layers have varying degrees of impurity.

4. Production of point-contact germanium transistors was to be started in early 1955. The Dralowid plant had received positive assurance from the State Planning Commission that the necessary funds would be made available.

5. No essential progress had been made as yet by Fulter's team in the development of junction-type germanium transistors. The plan for this development provided that it should be completed by the end of 1955.

25X1

SECRET